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## LIST OF NOMENCLATURE

### Symbols

$A_{yy}$	- Coefficient of added mass moment of inertia for pitching motion
$a$	- Virtual mass, or virtual mass moment of inertia
$a_z$	- Added mass for heaving
$B$	- Coefficient of pitch damping moment
$B_n$	- Waterline breadth for nth section
$b$	- Coefficient for damping force or damping moment
$b_n$	- Damping coefficient per unit length
$C$	- Coefficient for pitch restoring moment
$c$	- Coefficient for restoring force or restoring moment
$E$	- Wave energy per unit area of free surface
$h_w$	- Height of wave
$I_{yy}$	- Mass moment of inertia for pitching
$k$	- Wave number
$k_{yy}$	- Radius of gyration for pitching
$LBP$	- Length between perpendiculars
$L_w$	- Wavelength from crest to crest
$L_s$	- Length of ship equivalent to LBP
$R_{AW}$	- Mean resistance increase in waves, that is, resistance in waves minus resistance in still water

$T_e$	- Period of encounter
$T_w$	- Wave period
$T_z$	- Natural period (in smooth water) for heaving
$T_\theta$	- Natural period (in smooth water) for pitching
$T_\phi$	- Natural period (in smooth water) for rolling
$u$	- Horizontal component of water velocity vertical component of water velocity
$V_w$	- Wave velocity or celerity
$z$	- Heaving motion
$z_a$	- Heaving amplitude
$\beta$	- Sectional area coefficient
$\varepsilon$	- Phase angle between motions and waves
$\varepsilon_1$	- Phase angle between wave motion and exciting force (or moment)
$\varepsilon_2$	- Phase angle between exciting force (or moment) and motions
$\zeta$	- Instantaneous wave elevation
$\zeta_a$	- Wave amplitude
$\overline{\zeta_a}$	- Apparent wave amplitude
$\theta$	- Pitch angle
$\theta_a$	- Pitch amplitude
$\mu$	- Heading angle
$\omega_e$	- Frequency of encounter
$\omega_w$	- Wave frequency
$\omega_z$	- Natural (circular) frequency for heaving

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